

CLAIMS

What is claimed is:

1. A composition comprising:

A) at least one component selected from the group consisting of:

1) unsaturated polyester resins; and

2) organic peroxide initiators;; and

B) at least one dye that is compatible with any organic peroxide present and is selected from the group consisting of anthraquinone derivatives, pyrazalone derivatives, and mixtures of the foregoing.

2. The composition of claim 1 wherein the peroxide is selected from the group consisting of ketone peroxides, hydroperoxides, diacyl peroxides, peroxyketals, peroxyesters, peroxydicarbonates, and mixtures of the foregoing.

3. The composition of claim 2 wherein the peroxide is selected from the group consisting of methyl ethyl ketone peroxide, methyl isobutyl ketone peroxide, cyclohexanone peroxide, cumene hydroperoxide, t-butyl hydroperoxide, benzoyl peroxide, lauroyl peroxide, 1,1-di(t-butyl peroxy)cyclohexane, 1,1-di(t-butyl peroxy)3,3,5-trimethylcyclohexane, t-butyl peroxybenzoate, t-butyl peroxy 2-ethyl hexanoate, bis(4-t-butyl cyclohexyl) peroxydicarbonate) and mixtures of the foregoing.

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1 4. The composition of claim 1 wherein the dye does not impart substantial instability to
2 the peroxide, does not substantially fade during the shelf life of the peroxide, and does not
3 substantially affect the performance of the peroxide in curing polyester resins.

1 5. The composition of claim 1 wherein the dye is selected from the group consisting of
2 Solvent Blue 128, mixtures of Solvent Blue 128 with Solvent Blue 58, Solvent Violet 38,
3 Solvent Yellow 163, Solvent Violet 14, Solvent Blue 14, Solvent Blue 101, and mixtures of
4 the foregoing.

1 6. A composition comprising an organic peroxide, a polyester resin, and at least one dye
2 compatible with said organic peroxide, wherein said dye is selected from the group consisting
3 of anthraquinone derivatives, pyrazolone derivatives, and mixtures thereof.

1 7. The composition of Claim 6 wherein the dye is added at a level ranging from about
2 0.001 to about 10 wt.% based on the weight of the peroxide.

1 8. The composition of claim 6 wherein the peroxide is selected from the group consisting
2 of ketone peroxides, hydroperoxides, diacyl peroxides, peroxyketals, peroxyesters,
3 peroxydicarbonates, and mixtures of the foregoing.

1 9. The composition of claim 8 wherein the peroxide is selected from the group consisting
2 of methyl ethyl ketone peroxide, methyl isobutyl ketone peroxide, cyclohexanone peroxide,
3 cumene hydroperoxide, t-butyl hydroperoxide, benzoyl peroxide, lauroyl peroxide,

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1,1-di(t-butyl peroxy)cyclohexane, 1,1-di(t-butyl peroxy)3,3,5-trimethylcyclohexane, t-butyl peroxybenzoate, t-butyl peroxy 2-ethyl hexanoate, bis(4-t-butyl cyclohexyl) peroxydicarbonate) and mixtures of the foregoing.

10. The composition of claim 6 wherein the dye is selected from the group consisting of Solvent Blue 128, mixtures of Solvent Blue 128 with Solvent Blue 58, Solvent Violet 38, Solvent Yellow 163, Solvent Violet 14, Solvent Blue 14, Solvent Blue 101, and mixtures of the foregoing.

11. A composition comprising:

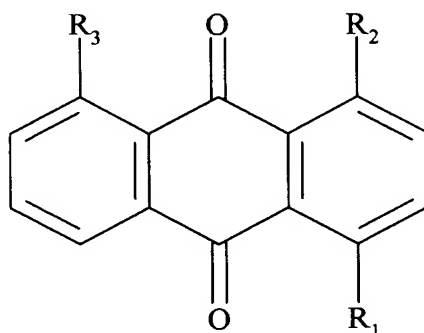
A) at least one component selected from the group consisting of:

1) unsaturated polyester resins; and

2) organic peroxide initiators; and

B) at least one dye that is compatible with any organic peroxide present and is selected from the group consisting of:

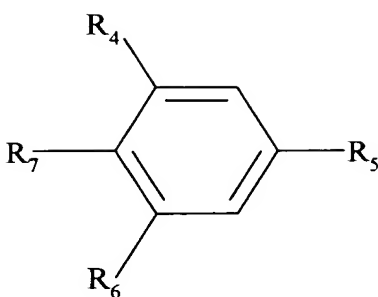
1) anthraquinone derivatives of the structure:



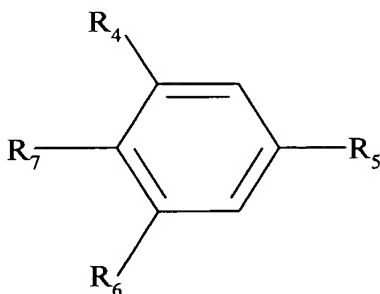
wherein R₁, R₂, and R₃ are independently selected from the group consisting of hydrogen,

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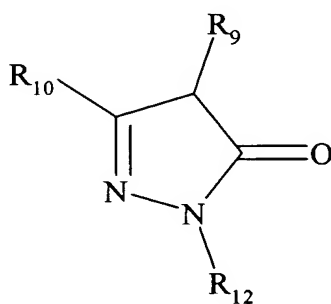
alkyl, and



wherein R₇ is -NH, -NH-R₈, or -S, R₈ is alkylene, and R₄, R₅, and R₆ are independently selected from the group consisting of hydrogen, alkyl, and halogen, provided that at least one of R₁, R₂, and R₃ is



2) pyrazolone derivatives of the structure:



wherein

R₉ is hydrogen or -NH-R₁₁,

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38 R_{10} and R_{11} are independently selected from the group consisting of alkyl, aryl, and aralkyl,
39 and
40 R_{12} is an aryl group; and
41 3) mixtures thereof.

1 12. The composition of claim 11 wherein the peroxide is selected from the group
2 consisting of ketone peroxides, hydroperoxides, diacyl peroxides, peroxyketals, peroxyesters,
3 peroxydicarbonates, and mixtures of the foregoing.

1 13. The composition of claim 12 wherein the peroxide is selected from the group
2 consisting of methyl ethyl ketone peroxide, methyl isobutyl ketone peroxide, cyclohexanone
3 peroxide, cumene hydroperoxide, t-butyl hydroperoxide, benzoyl peroxide, lauroyl peroxide,
4 1,1-di(t-butyl peroxy)cyclohexane, 1,1-di(t-butyl peroxy)3,3,5-trimethylcyclohexane, t-butyl
5 peroxybenzoate, t-butyl peroxy 2-ethyl hexanoate, bis(4-t-butyl cyclohexyl)
6 peroxydicarbonate) and mixtures of the foregoing.

1 14. The composition of claim 11 wherein the dye is selected from the group consisting of
2 Solvent Blue 128, mixtures of Solvent Blue 128 with Solvent Blue 58, Solvent Violet 38,
3 Solvent Yellow 163, Solvent Violet 14, Solvent Blue 14, Solvent Blue 101, and mixtures of
4 the foregoing.

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1 15. In a process for curing unsaturated polyester resins with organic peroxide initiators,
2 the improvement that comprises combining an unsaturated polyester resin, an organic peroxide
3 initiator, and at least one dye that is compatible with the organic peroxide and is selected from
4 the group consisting of anthraquinone derivatives, pyrazalone derivatives, and mixtures
5 thereof.

1 16. The process of Claim 15 wherein the dye is added at a level ranging from about 0.001
2 to about 10 wt.% based on the weight of the peroxide.

1 17. The process of claim 15 wherein the peroxide is selected from the group consisting of
2 ketone peroxides, hydroperoxides, diacyl peroxides, peroxyketals, peroxyesters,
3 peroxydicarbonates, and mixtures of the foregoing.

1 18. The process of claim 17 wherein the peroxide is selected from the group consisting of
2 methyl ethyl ketone peroxide, methyl isobutyl ketone peroxide, cyclohexanone peroxide,
3 cumene hydroperoxide, t-butyl hydroperoxide, benzoyl peroxide, lauroyl peroxide,
4 1,1-di(t-butyl peroxy)cyclohexane, 1,1-di(t-butyl peroxy)3,3,5-trimethylcyclohexane, t-butyl
5 peroxybenzoate, t-butyl peroxy 2-ethyl hexanoate, bis(4-t-butyl cyclohexyl)
6 peroxydicarbonate) and mixtures of the foregoing.

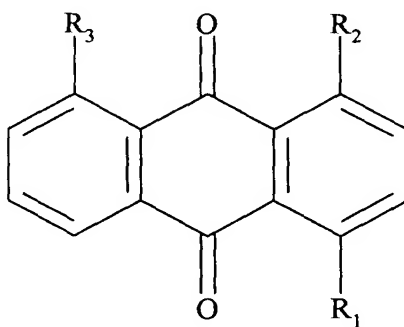
1 19. The process of claim 15 wherein the dye is selected from the group consisting of
2 Solvent Blue 128, mixtures of Solvent Blue 128 with Solvent Blue 58, Solvent Violet 38,
3 Solvent Yellow 163, Solvent Violet 14, Solvent Blue 14, Solvent Blue 101, and mixtures of

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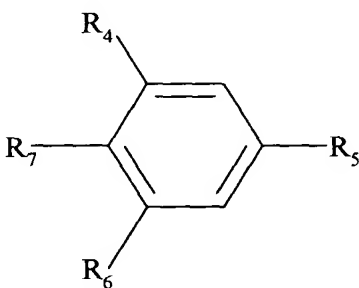
the foregoing.

20. In a process for curing unsaturated polyester resins with organic peroxide initiators, the improvement that comprises combining an unsaturated polyester resin, an organic peroxide initiator, and at least one dye that is compatible with the organic peroxide and is selected from the group consisting of:

A) anthraquinone derivatives of the structure:

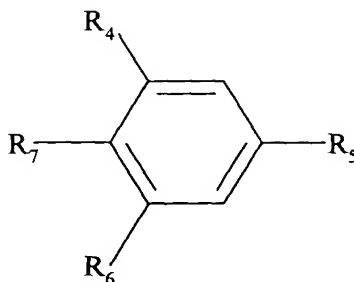


wherein R_1 , R_2 , and R_3 are independently selected from the group consisting of hydrogen, alkyl, and

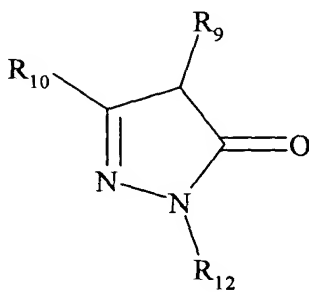


wherein R_7 is -NH, -NH- R_8 , or -S, R_8 is alkylene, and R_4 , R_5 , and R_6 are independently selected from the group consisting of hydrogen, alkyl, and halogen, provided that at least one of R_1 , R_2 , and R_3 is

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B) pyrazolone derivatives of the structure:



wherein

R₉ is hydrogen or -NH-R₁₁,

R₁₀ and R₁₁ are independently selected from the group consisting of alkyl, aryl, and aralkyl,

and

R₁₂ is an aryl group; and

C) mixtures thereof.

21. The process of Claim 20 wherein the dye is added at a level ranging from about 0.001 to about 10 wt.% based on the weight of the peroxide.

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1 22. The process of claim 20 wherein the peroxide is selected from the group consisting of
2 ketone peroxides, hydroperoxides, diacyl peroxides, peroxyketals, peroxyesters,
3 peroxydicarbonates, and mixtures of the foregoing.

1 23. The process of claim 22 wherein the peroxide is selected from the group consisting of
2 methyl ethyl ketone peroxide, methyl isobutyl ketone peroxide, cyclohexanone peroxide,
3 cumene hydroperoxide, t-butyl hydroperoxide, benzoyl peroxide, lauroyl peroxide,
4 1,1-di(t-butyl peroxy)cyclohexane, 1,1-di(t-butyl peroxy)3,3,5-trimethylcyclohexane, t-butyl
5 peroxybenzoate, t-butyl peroxy 2-ethyl hexanoate, bis(4-t-butyl cyclohexyl)
6 peroxydicarbonate) and mixtures of the foregoing.

1 24. The process of claim 20 wherein the dye is selected from the group consisting of
2 Solvent Blue 128, mixtures of Solvent Blue 128 with Solvent Blue 58, Solvent Violet 38,
3 Solvent Yellow 163, Solvent Violet 14, Solvent Blue 14, Solvent Blue 101, and mixtures of
4 the foregoing.